d- $N_{\alpha\,formé} = N_{Po\ désintégré} = N_0 - N = \dfrac{(m_0 - m)}{m_{Po}}$

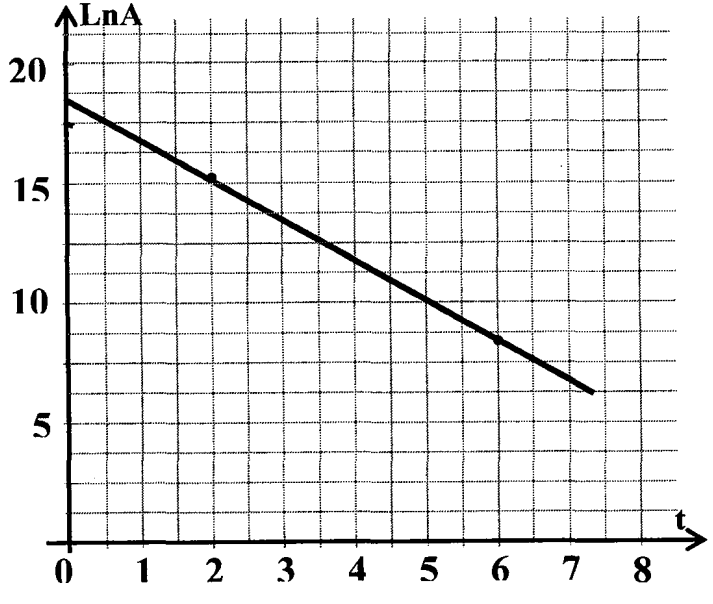
$$N_\alpha = \frac{(1 - 2{,}556.10^{-2}).10^{-9}}{210 \times 1{,}66.10^{-27}} = 2{,}8.10^{-15}\ \text{noyaux.}$$

e- $A = \lambda N = \left(\dfrac{Ln2}{T}\right)\left(\dfrac{m}{m_{Po}}\right) = \left(\dfrac{Ln2}{138 \times 24 \times 3600}\right).\left(\dfrac{2{,}556.10^{-11}}{210 \times 1{,}66.10^{-27}}\right)$

$\Rightarrow A = 4{,}26.10^6\,Bq$

f- $A = \lambda N \Rightarrow A = A_0 e^{-\lambda t} \Rightarrow LnA = -\lambda t + LnA_0$

$(\lambda = 5{,}02.10^{-3}\,j^{-1} = 1{,}8833 ans^{-1}$



La courbe **LnA=f(t)** est une droite décroissante :

Ln A = - 1,833t + 18,9

$t = 0 \Rightarrow A_0 = \lambda \dfrac{m_0}{m} = 167.10^6\,Bq \Rightarrow LnA_0 = 18{,}9.$

$t = 2ans \Rightarrow A = 4{,}26.10^6\,Bq \Rightarrow LnA = 15{,}3.$

Exercice n°9 :

1°) ${}^{235}_{92}U + {}^{1}_{0}n \longrightarrow {}^{137}_{55}Cs + {}^{97}_{40}Zr + x\left({}^{1}_{0}n\right) + y\left({}^{0}_{-1}e\right)$

* $235 + 1 = 137 + 97 + x \Rightarrow x = 2$

* $92 \rightarrow 55 + 40 - y \Rightarrow y = 3$

2°) $W_{libérée} = E_{l_f} - E_{l_{in}} = E_{l(Cs)} + E_{l(Zr)} - E_{l(U)}$

$= 137 \times 8{,}4 + 97 \times 8{,}6 - 235.7{,}6$

$= 199\ MeV = 199 \times 1{,}6.10^{-13} = 3{,}18.10^{-11}J$

3°) $W_{libérée} = |\Delta m| C^2$

$= \left(\left(m(n) + m(U)\right) - \left(m(Xe) + m(Sr) + 2m(n)\right)\right).C^2$

$W_{lib} = \left((1{,}0087 + 235{,}12) - (138{,}955 + 94{,}945 + (2 \times 1{,}0087))\right).u.C^2$

$0{,}2125 \times 1{,}66.10^{-27}(3.10^8) = 3{,}17475.10^{-11}J$

Exercice N°10 :

1°)

a- ${}^{2}_{1}H + {}^{3}_{1}H \longrightarrow {}^{4}_{2}He + {}^{A}_{Z}X$